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TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE

Entry characteristics, academic achievement and teaching practices: A comparative study of two categories of newly qualified teachers in basic schools in Ghana

Christopher Yaw Kwaah^{1*} and Paivi Palojoki²

Abstract: Entry qualification, academic achievement, and teaching practices of newly qualified teachers (NQTs) enrolled into the teacher education programme directly from senior high school (DfSHS) were compared with NQTs enrolled through the Untrained Teacher Diploma in Basic Education (UTDBE) programme. Survey data collected from 140 NQTs (84 DfSHS and 56 UTDBE) of 20 public schools in central Ghana and lesson observations showed that the two categories of Newly qualified teachers differed greatly in entry grades and academic achievements during training. Differences in teaching practices pertained to content knowledge, classroom interactions, and lesson closure. Implications for pre-service and in-service teaching training are discussed.

Subjects: Educational Research; Education Studies; Teachers & Teacher Education

Keywords: teaching practices; newly qualified teachers; entry characteristics; academic achievement; content knowledge; Ghana

ABOUT THE AUTHORS

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Paivi Palojoki is a professor of teacher education in the Teacher Education Department in the Faculty of Behavioural Sciences, University of Helsinki, Finland. Her research focus is on teacher development, identity building and in-service teacher training in various learning contexts.

PUBLIC INTEREST STATEMENT

In this article, we compared entry qualifications, academic achievements and teaching practices of two types of newly qualified teachers in basic schools in Ghana. One group enrolled on initial teacher education programme directly from secondary schools and another enrolled on the same programme who were already teaching but are untrained. This study became necessary in the wake of the quest for qualified teachers in our schools to achieve quality basic education. The results show large differences in the entry qualifications and academic achievements between the two type of teachers; hence, prospective trainees with weak subject content knowledge had difficulties with academic work during training affecting their teaching after training. Similarities existed in aspects of their teaching practices when their teachings were observed. We strongly recommended that the selection of prospective teacher trainees should be based on strong academic background despite lowering entry qualifications into teacher training amidst shortage of qualified teachers.

1. Introduction

Central to the Government of Ghana's Poverty Reduction Strategy (GPRS) is the provision of quality education. One of the policy goals of the Ministry of Education is to improve the quality of teaching and learning for improved pupil/student achievement. Meeting this objective requires qualified teachers who are well versed with the teaching practices needed to teach in basic schools (Ministry of Education, Science and Sports, 2008). In fact, the literature shows that the teaching practices of teachers are closely related to the quality of teachers (Grossman, Hammerness, & McDonald, 2009; Shulman, 1987). Quality of education is also linked to the teaching and learning process, and classroom interactions are at the core of education quality (Ngware, Oketch, & Mutisya, 2014). According to Charalambous, Komitis, Papacharalambous, and Stefanou (2014, p. 23), "irrespective of the content a teacher teaches, several teaching practices can be important for student learning outcome". Such teaching practices include posing good questions, managing classroom time, establishing a positive classroom climate, and assessing student learning outcome (Muijs & Reynolds, 2010; OECD, 2010). Previous studies show that the use of diverse teaching practices has an effect on student learning outcomes, which is linked to quality of education (Grossman et al., 2009; Ireland, Watters, Lunn, Brownlee, & Lupton, 2014; Kyriakides & Creemers, 2008; OECD, 2010; Postareff, 2007). However, few studies have focused on the differences in teaching practices among different categories of teachers. Empirical evidence from studies exploring teacher-level factors show that what teachers do in the classroom is more influential (Muijs & Reynolds, 2010; Stronge, Ward, & Grant, 2011) than teacher attributes, teachers' beliefs (Twigg, 2010), their job satisfaction or their background qualification (Palardy & Remberger, 2008). Teachers who possess good teaching practices are expected to increase pupils' learning achievement (Akyeampong & Stephens, 2002). Further, teacher education cultivates in student teachers' the ability to transfer their teaching practices in general (Endedijk, Vermunt, Meijer, & Brekelmans, 2014; Fullana, Pallisera, Colomer, Fernández Peña, & Pérez-Burriel, 2014) and to modify them in response to different learning approaches (Lindblom-Ylänne, Trigwell, Nevgi, & Ashwin, 2006).

While the importance of recruiting qualified teachers to ensure quality education is well acknowledged, the governments of many developing countries are forced to employ a number of untrained teachers in basic schools because of teacher shortage, especially in rural areas (Mulkeen, 2010). The training of these unqualified in-service teachers involved a combination of residential training on colleges' campuses, short courses at local centers and supported with self-study print materials. However, the duration and structure of the training vary across countries. (Kruijer, 2010; Mulkeen, 2010). The recruitment of these untrained in schools has an effect on the quality of education. For instance, in Ghana, despite government efforts to improve the quality of education at the basic levels, national standardized examinations such as the National Education Assessment (NEA), School Education Assessment (SEA), and Basic Education Certificate Examination (BECE) have shown poor performance by basic school pupils. The NEA results in 2011 revealed that 44% of pupils in public schools had achieved primary three (P3) minimum competency in Mathematics and 62% achieved P3 minimum competency in English Language. In 2013, the results in Mathematics were notably lower in public schools, with only 7.6% of the pupils reaching proficiency at P6 and 15.3% at P3 (National Education Assessment, Ghana, 2012). This poor performance of basic school pupils has been attributed partly to teachers' lack of requisite teaching skills needed to promote effective teaching and learning (Akyeampong, Lussier, Pryor, & Westbrook, 2013).

While acknowledging the fact that teacher knowledge is only a part of teacher effects that affect students' learning, studies (Chen, Brown, Hattie, & Millward, 2012; Mukeredzi & Mandrona, 2013; Ngware et al., 2014) have recognized that teacher skills such as teacher assessment, questioning strategies, providing orientation/structuring information have a larger effect on student learning outcomes. Linking teaching practices of teachers to their professional training, reports also suggest that some student teachers' weak entry grades at the Colleges of Education (CoEs) affect their academic performance at CoEs and their teaching at basic schools after training (Akyeampong et al., 2013). This poor performance of pupils compelled the Ghanaian government to initiate the

Untrained Teachers' Diploma in Basic Education (UTDBE), a program aimed to upgrade the content knowledge and methods of teaching of a vast number of untrained teachers, in an effort to ensure education quality in basic schools (Ministry of Education, 2012). The program allows untrained teachers to become newly qualified teachers (NQTs), just as with NQTs from residential programs at CoEs. However, little is known about the entry characteristics and the academic achievements of NQTs who went directly from senior high school (DfSHS) to teacher training and those who went through the UTDBE program.

1.1. Study context

In Ghana, initial teacher education is provided at teacher training universities and CoEs. At both levels, the concurrent model of training, which provides both subject content and pedagogical skills, is employed. Universities offer four-year degree programs to produce teachers and education officers for the basic and secondary levels while CoEs offer a three-year Diploma in Basic Education (DBE) to train teachers for only basic schools. This study focuses on the diploma-awarding CoEs. The DBE can be attained through three different routes. The first is the regular residential three-year program offered by the CoEs. This is mostly for senior high school graduates with virtually no experience in teaching. The second is the four-year UTDBE program introduced in 2004/2005 academic year for senior high school and middle school graduates who are untrained but teaching in basic schools. This is a non-residential distance-learning program delivered via prepared offline modules with face-to-face tutor interactions during vacations. The third is the two-year four-semester combination program introduced in 2007, which enables trained certificate "A" teachers to obtain a DBE (Institute of Education, University of Cape Coast, 2010).

Teachers in Ghana enjoyed high social status in the 1950s until the decline of the Ghanaian economy in the 1970s which resulted in poor remuneration for teachers (World Bank, 2004) compared with other salaried professionals. This was as a result of the expansion of the workforce which required lowering of entry requirements into teacher training institutions (Osei, 2006).

1.2. Conceptual framework

The conceptual framework of this study focuses on teachers' classroom practices. These practices have been categorized into three broad areas: teaching strategies and delivery, assessment practices, and classroom organization and management. These three areas were conceptualized on the basis of existing studies conducted on teaching practices in Sub-Saharan Africa (Akyeampong, et al., 2013; Adu-Yeboah, 2011; Mulkeen, 2010) and other parts of the world (Charalambous et al., 2014; Kyriakides & Creemers, 2008; OECD, 2009; Zheng & Borg, 2013). Although teacher quality is associated with many factors such as teacher qualifications, personal attributes, teachers' cooperation with other teachers and instructional skills and practices (Palardy & Remberger, 2008), this study focuses on literature on classroom teaching practices for two reasons: research indicates that in terms of teacher evaluation, teachers themselves prefer criteria that focus on their classroom practices (Charalambous et al., 2014; Kyriakides & Creemers, 2008), and studies exploring teacher-level factors suggest that what matters most for student learning is what the teachers do in the classroom (Richardson, 2005; Stronge et al., 2011).

Furthermore, the subject content knowledge and pedagogical content knowledge (PCK) teachers bring into the classroom have an effect on their teaching practices across subjects (Pryor, Akyeampong, Westbrook, & Lussier, 2012; Shulman, 1986). By PCK we mean insight into what Shulman (1986) describes as 'the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations and demonstrations that make it comprehensible to others (p. 9). Mulkeen's (2010) study in SSA countries indicates that trainees who have weak content knowledge of secondary school subjects found it difficult to comprehend more advance material during training. However, his study did not indicate student teachers' entry characteristics into teacher training. Additionally, a rigorous literature review of pedagogy, curriculum, teaching practices and teacher education studies in low-income countries including SSA countries (Westbrook et al., 2013) found that very few studies could report on the background

characteristics of teachers including NQTs, which made it difficult to compare different categories of teachers. It is therefore imperative to fill the knowledge gap in the kind of entry characteristics, academic achievements and teaching practices of two categories of NQTs in the Ghanaian and other similar contexts in SSA to inform policy and practice.

1.3. Teaching practices

Several studies conducted both nationally and internationally (Charalambous et al., 2014; Kyriakides & Creemers, 2008) have provided empirical evidence to support three dimensions of teaching practices; i.e. structuring, student orientation and enhanced activities. Structuring is a component of direct instruction or whole-class teaching method and refers to practices such as starting the lesson with an overview or reviewing the lesson objectives, outlining the content to be taught, signaling transitions between lesson parts, and calling attention to and reviewing the main ideas in a lesson (Charalambous et al., 2014; Kyriakides & Creemers, 2008; OECD, 2010). The analysis of the Teaching and Learning International Survey (TALIS) results from over 30 Organisation for Economic Co-operation Development (OECD) countries identifies structuring as the dominant instructional practice that teachers use (OECD, 2010). Enhanced activities are learning activities that enhance students' own agency/motivation or comprehension. Enhanced activities such as working on projects and writing an essay are less frequently used by teachers than student-oriented practices in many of the countries studied in the OECD survey in 2010. Student-oriented practices refer to series of related activities in class that involve pupils or students working on exercises or tasks in groups or individually that challenge students to identify reasons associated with such activities (OECD, 2010).

In SSA, teachers' classroom practices have been largely dominated by face-to-face interactions with constant reliance on rote learning and memorization (Akyeampong, et al., 2013; Lauwerier & Akkari, 2015) even though other studies have indicated a mixture of student-centred and teacher-led instructions (Azigwe, Kyriakides, Panayiotou, & Creemers, 2016; Westbrook et al., 2013). Additionally, Azigwe et al.'s (2016) study in Ghana found that integrated approaches such as orientation, structuring, application and questioning had statistical significant effect on students' achievement. Other studies in Ghana have also revealed teachers' use of fixed teaching procedures that lacked reflection on the relevance of the procedures on its impact on students (Adu-Yeboah, 2011; Ampadu, 2012). This suggests that teachers in different parts of the world employ ability grouping and individual-adapted tasks more often than assigning students projects or things to do. The OECD (2010) teaching practices survey showed that in countries such as Brazil, Korea, Malta and Mexico, enhanced activities and student-oriented practices are frequently used by teachers. This is also the strategy preferred in Finnish teacher education and Finnish schools, and students from the latter have proved to be very successful according to the Programme for International Student Assessment (PISA) (Lindblom-Ylänne, 2006; Simola, 2005).

The syllabus for basic schools in Ghana recommends teaching practices such as discussions, small group work, demonstrations, and questions and answers (GES, 2007) for teaching in basic schools. The syllabus further suggests that teachers should not advocate rote learning or drill-oriented methods but instead, promote participatory teaching and learning processes (see also Marton & Säljö, 1984) as well as enhanced thinking skills (see Lonka & Ahola, 1995). These teaching strategies are recommended for teaching mathematics, in addition to demonstration, group work, practical problem-solving techniques, and all these techniques lead from content-focused to learning-focused teaching methods (Marton & Säljö, 1984; Postareff, 2007).

Assessment is a part of teachers' classroom practices and an important aspect of teaching. Assessment literature classified assessment into two main types: summative assessment and formative assessment. Summative assessment, which is also called assessment of learning (Yang, 2012), is used to assign a course grade to students at the end of a course or project. Formative assessment or assessment for learning, ongoing assessment, or dynamic assessment (Öz, 2014; Taras, 2005) refers to most of the daily evaluation of students through quizzes,

exercises, classroom questions or short tests geared toward the provision of information that can have a direct consequence on teaching and learning. According to Atjonen (2014), the quality of assessment is affected by the quality of the questioning. Hence, questions should be planned and prepared such that they elicit an appropriate response from the children, clarifying what they know, can do, and understand. While the type of questions used by a teacher usually depends on the topic and the objectives of the lesson, Muijs and Reynolds (2010) make it clear that avoiding open-ended questions is ineffective as it may result in the teacher not posing a cognitive challenge to the pupils.

Studies conducted in different parts of the world have shown a correlation between classroom climate and student achievement. Student-teacher interactions such as frequent use of questioning, communicating with the class and the use of “high-order” questions were found to have positive effects on pupils’ learning in schools in England and Wales (Muijs & Reynolds, 2010) as well as in Finland (Lindblom-Ylänne et al., 2006; Lonka & Ahola, 1995). Similarly, in their research in the United States on teacher effectiveness and student achievement, Stronge Ward and Grant (2011) found that the use of a wide variety of questions has a strong influence on student achievement. This has also been confirmed in similar studies elsewhere (Clarke et al., 2007; Jensen, Sandoval-Hernandez, Knoll, & Gonzalez, 2012; OECD, 2010). However, what these studies lacked is an exploration of the teachers’ lessons—to determine what kind of questions teachers posed and how they treated the pupils’ responses. Hence, this study employs classroom observation as a follow-up to a survey data. It is worth noting that within the Ghanaian and by extension other SSA contexts, very few studies exist to specifically address the research questions posed in this current study. This current study, therefore, provides information on the teaching practices of two categories of NQTs to identify areas that need to be critically considered and improved in the re-training of teacher educators, mentors and continuous professional development programmes. Secondly, the study will provide evidence for stakeholders in the upgrading of under-qualified teachers in Ghana and other similar contexts. The following research questions were designed to guide this study.

1.4. Research questions

- (1) How does the entry qualification of newly qualified teachers who entered initial teacher training directly after SHS (DfSHS) compare with that of newly qualified teachers who entered after completing the UTDBE program?
- (2) In COEs, how do the achievement levels in English, Mathematics and Science of newly qualified teachers who entered initial teacher training directly after SHS (DfSHS) compare with that of newly qualified teachers who entered after completing the UTDBE program?
- (3) What teaching practices are used by DfSHS and UTDBE teachers in basic schools?

2. Methods

2.1. Mixed method design

This study employed a sequential mixed method design, with both quantitative and qualitative techniques (Creswell, 2013) in the collection of data. A multi-stage sampling procedure was used to select basic schools and teachers for the study. First, all 386 public schools in the Mfantseman municipality were classified into rural or urban schools based on the municipal criteria (a community with inhabitants of 5000 or more is urban and below 5000 is considered rural). From these, schools with both categories of NQTs (350) were selected for sampling, and subsequently, 20 public schools were shortlisted through random sampling from the rural-urban grouping. There were 15 urban and 5 rural schools for the sample. The rural schools had poor infrastructure and resources compared to the urban schools, even though not much difference existed in terms of teacher deployment. To ensure that the study sample was representative of each population group in terms of size, a total of 140 teachers (DfSHS = 84, UTDBE = 56) were recruited for the survey

based on Krejcie & Morgan's (cited in Cohen, Manion, & Morrison, 2013) sample size recommendations. Out of these sampled teachers, 16 of the DfSHS taught in rural schools with 68 teaching in urban schools, while 18 of the UTDBE teachers taught in rural and 38 taught in urban schools. As part of the survey, data were also collected (trainees' entry grades and scores in content courses during training from 2009–2011) from the Institute of Education (IoE), University of Cape Coast (UCC) and Teacher Education Division (TED) of the Ghana Education Service (GES).

In the second part of the study, a sub-sample of 16 grade six teachers were purposively selected from the original sample for further investigation. Out of this number, 10 of the teachers were DfSHS and 6 were UTDBE teachers. All the teachers taught both English and Mathematics in urban schools except five teachers who taught in rural schools. This happened because some of the teachers in rural schools voluntarily opted out of the lesson observation. This part of the study involved qualitative observation (Kington, Sammons, Day, & Regan, 2011; Teddlie & Yu, 2007) of lessons in Mathematics and English. The purpose of the observation was to confirm qualitatively issues regarding the teachers' teaching practices that emerged from the survey. Grade six was chosen for lesson observation because it has the highest subject content in terms of teaching and learning in the primary school system. Further, English and Mathematics were selected in particular because these subjects are compulsory for all students from basic to senior high schools in Ghana.

2.2. Instruments

The TALIS teacher questionnaire was adapted for this study to assess teaching practices. The TALIS questionnaire had been validated and used in over 30 countries, which are a part of the Organisation for Economic Co-operation Development (OECD) to assess teaching practices for various teachers with different background characteristics (OECD, 2010), hence its adoption for this study. Items on the background characteristics of teachers were modified to suit the study context. Section A on the questionnaire sought data on the background information of the trained teachers while Section C sought information on how often classroom activities were conducted throughout the school year. This section was divided into three parts (teaching strategies and delivery, assessment practices, and classroom organization and management). This section also consisted of items for which the teachers had to provide frequency estimations on a five-point Likert scale, ranging from "never or hardly ever," "In about one-quarter of the lessons," "In about one-half of the lessons," "In about three-quarters of the lessons," and "In almost every lesson." Items under "teaching strategies and delivery" were taken from the TALIS teacher questionnaire. Items 23, 24, and 27 under "assessment practices" and items 34 to 40 were all taken from the teaching practice assessment form A of the University of Cape Coast.

The questionnaire was pre-tested in another region in Ghana with an overall internal consistency (Cronbach alpha) coefficient of 0.76. The observation guide was also pre-tested, producing valid responses which were consistent with most of the responses from the questionnaire. The observation guide was developed using the main themes of the conceptual framework, and the guide also had a section that provided background information. There were six themes on the guide: "Introduction of lesson and planning," "Presentation of lesson (methodology)," "Class control and management," "Knowledge of subject matter," "Evaluation and feedback," and "Closure."

2.3. Procedure

Prior to data collection, an informed written consent, approved by the Internal Review Board of the University of Cape Coast was signed by all participating teachers. The aims and procedures of the study were explained to all participants. The corresponding author sought permission for obtaining data (end-of-semester examination results for DBE and UTDBE trainees from 2009–2011) from the Institute of Education, UCC, and the TED of GES. Data on the entry grades of trainees who went to COEs and those who enrolled in the UTDBE program were obtained from the Institute of Education and the Teacher Education Division, respectively. Further, student teachers' (regular DBE and

UTDBE) raw scores at their end-of-semester examinations were also obtained from the Institute of Education.

The fieldwork was carried out in two stages. The first stage took place between October 2014 and January 2015 and the second between February 2015 and March 2015. The second stage of the data collection was done as a follow-up on the findings of the survey conducted in the first stage. Follow-up visits were made to all the schools for the lesson observation exercise. Lesson observations were done with only grade six teachers. Two graduate students were trained as research assistants to assist in the lesson observation exercise. In all, four researchers including the authors carried out the lesson observation, which took two months to complete. Two researchers visited a school on any given day. In each school, the researchers waited for the class teacher to prepare for the lesson observation. Grade six English and Mathematics lessons were observed in each school. A single observation lasted between 30 and 60 min. To ensure reliability, two researchers observed the lesson independently, and after the lesson, individual notes were compared to agree on a common issue. Using the lesson observation guide, the two observers had to agree on common issues for each teacher on a particular theme on the observation guide. The challenge of this procedure was the lengthy debate on agreeing on a common observation trait under one particular theme. To ensure consistency and preserve the validity of the study, similar data collection techniques were employed in all the schools during the lesson observation exercises.

2.4. Analysis

To compare the entry grades of DfSHS and UTDBE trainees, the grades were plotted on bar graphs to depict the distribution of trainees' grades across all three year periods. To compare achievement levels of newly qualified teachers who directly entered CoEs (DfSHS) with those of untrained teachers who graduated from the UTDBE program, raw scores of their external examinations (from the Institute of Education) in English, Mathematics, and Science courses were converted into percentages. Means and standard deviations of the converted scores were used to compare their achievement levels in the courses across three different years (2009–2011). The teaching practices of the two groups of teachers were analyzed by comparing means and standard deviations on the basis of the three broad themes under teaching practices. Items on the questionnaires were assigned values on a five-point Likert-type scale (1 = never or hardly ever, 2 = in about one-quarter of the lessons, 3 = in about one-half of the lessons, 4 = in about three-quarters of the lessons, and 5 = in almost every lesson). A score of three, the mid-point, was chosen as the average value, implying that activities with scores below three were not frequently conducted in a teacher's class. Mean scores above the average of three indicated high frequency of the activity being conducted in class. Qualitative data gathered during the lesson observation were analyzed by extracting common patterns and themes. They were interpreted to amplify the quantitative data and provide insights into the classroom teaching practices of basic school teachers.

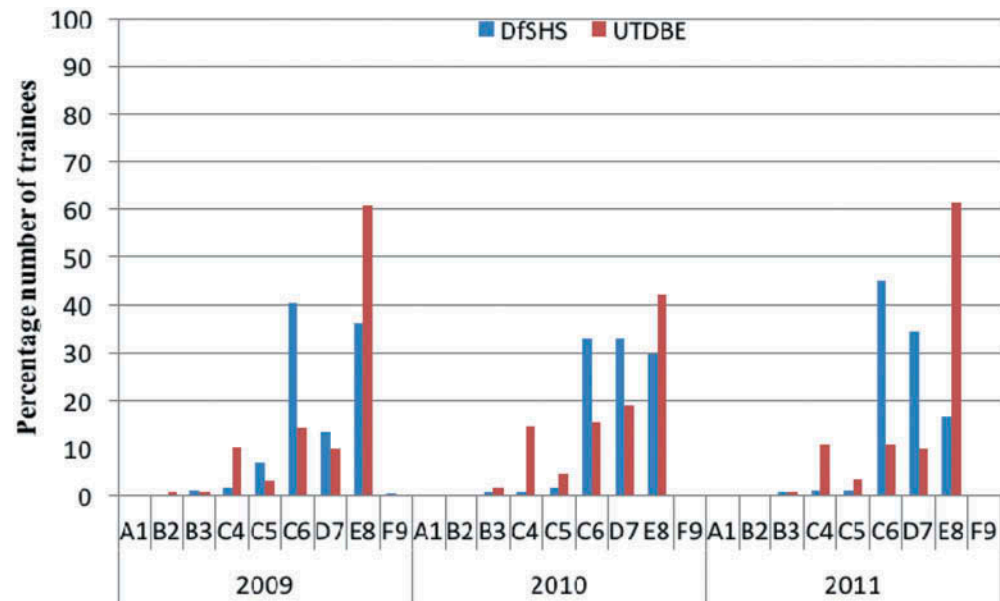
3. Results

3.1. Entry qualification of teacher trainees

The entry grades in English, Mathematics, and Science of trainees from each program (DfSHS and UTDBE) who completed their training in 2009, 2010, and 2011 were analyzed to determine their content knowledge at the beginning of training. The entry grades of the two groups of trainees in English are shown in Figure 1. The figure shows that UTDBE trainees' grades in English were consistently very poor across all three years. Over 60% of UTDBE trainees entered with a grade of E8 in 2009 and 2011. In 2010, a little over 40% entered with E8 and less than 20% entered with C4, C6 and D7. On the other hand, less than 40% of the DfSHS trainees entered with an E8 in English across the years, but over 30% entered with a grade of C6.

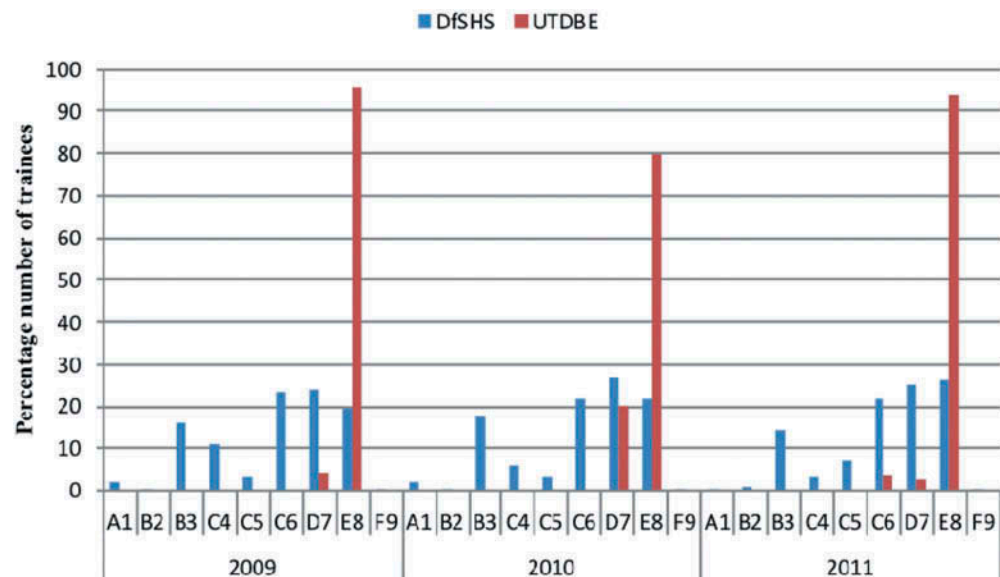
In summary from Figure 1, while less than 30% of the DfSHS trainees entered with weak grades, more than 50% of the UTDBE trainees entered with weak grades (i.e. D7 and E8). (See Appendix

Figure 1. Entry grades in English of two groups of trainees between 2009 and 2011.



A for grade interpretation). Figure 1 also confirms no trainee had an A or B2 in any of the years, indicating that neither group of teachers enters training with very good grades. The comparison of entry grades in Mathematics is presented in Figure 2. Over 90% of the UTDBE trainees entered with a grade of E8 in Mathematics in 2009 and 2011, and this number was 80.1% in 2010. Less than 30% of the DfSHS trainees entered with an E8 in Mathematics over all the years. Over 10% entered with B3 in all the years, and nearly 2% entered with a grade of A1. Results in Figure 2 show that over 10% of DfSHS trainees had B3, C6, and D7 across all the three years, whereas most of the UTDBE trainees had only C6, D7, and E8. The entry grades of the majority of UTDBE teachers are concentrated in the range between E8 and D7 whereas those of the DfSHS trainees are widely distributed from A1 to E8.

Figure 2. Entry grades in mathematics of two groups of trainees between 2009 and 2011.



The trends in the entry grades in Science were not very different from the rest of the subjects (see Figure 3). The percentage of UTDBE trainees who entered with an E8 grade were 83.7%, 90.8%, and 94.3% in 2009, 2010 and 2011, respectively, whereas in the same years, the percentage of DfSHS trainees who entered with an E8 grade were 28.7%, 31.3%, and 28.5%. The percentage of UTDBE trainees who entered with grades in D7 and E8 were higher than that of DfSHS trainees with similar grades. In fact, over 80% of the UTDBE trainees had E8 in Science. Over 60% of the DfSHS trainees entered with grades between A1 and D7 across all three years whereas the majority of the UTDBE trainees' grades in Science were between C5 and E8.

The analysis of entry grades shows that both DfSHS trainees and UTDBE trainees had weak grades in English, Mathematics, and Science; however, those of the UTDBE trainees were poorer than those of their DfSHS counterparts. In fact, grades of D7, E8, and F9 do not qualify a student to enroll in a program in tertiary institutions in Ghana, yet trainees with these grades were admitted into training programs at the CoEs.

3.2. Teacher trainees' academic achievement during training

For a meaningful comparison, content courses taken by both DfSHS and UTDBE trainees during the three-year period under consideration (2009–2011) were chosen for the analysis. One content course each was selected in English, Mathematics, and Integrated Science. Mean scores on English language studies I (FDC 111) are reported in Table 1. The results show that the mean score of the DfSHS trainees in English language studies (FDC 111) for all the three years was better than that of the UTDBE trainees in the same course. Further, the mean score of the DfSHS trainees in FDC 111 increased steadily between 2009 and 2011 while that of the UTDBE trainees fell from 2009 to 2010. The lower standard deviations for the DfSHS trainees in all the years indicate that most of their scores were clustered around the mean score as against the UTDBE trainees' scores, which were spread out from the mean score.

Results of the mean scores for the two groups of trainees in a mathematics content course (FDC 112) are reported in Table 2. Table 2 shows that DfSHS trainees' average scores in the course were better than those of their UTDBE counterparts. The average score of the UTDBE trainees in the mathematics content course was the lowest in 2009. Further, the high standard deviation in UTDBE scores in 2009 shows the wide distribution of the individual scores from the mean. The UTDBE trainees' average performance ($M = 35.1$, $SD = 20.3$) improved in 2011. Meanwhile, in 2009, the

Figure 3. Entry grades in Science of two groups of trainees between 2009 and 2011.

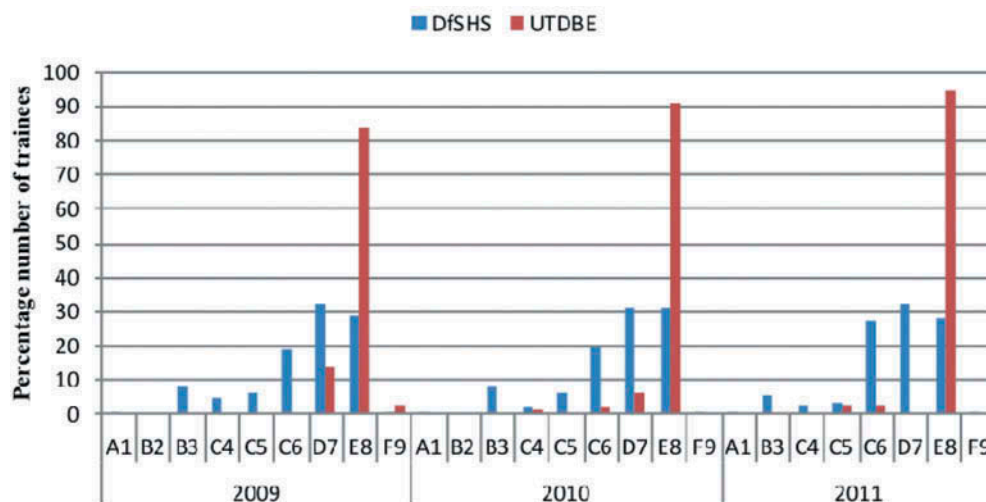


Table 1. Mean scores in English language content (FDC 111) of the two groups of trainees by year.

Year	Course	N	DfSHS		N	UTDBE	
			Mean	SD		Mean	SD
2009	FDC 111	3786	45.8	8.6	9602	35.4	13.8
2010	FDC 111	2277	47.8	8.2	7083	31.2	15.5
2011	FDC 111	1195	50.1	10.1	4904	32.9	12.3

Source (Adopted from Institute of Education) Maximum score = 100.

DfSHS: direct from SHS trainees; UTDBE: Untrained Teachers' Diploma in Basic Education trainees.

Table 2. Mean scores in mathematics content course (FDC 112) of the two groups of trainees by year.

Year	Course	N	DfSHS		N	UTDBE	
			Mean	SD		Mean	SD
2009	FDC 112	3770	39.6	16.5	9609	29.1	18.7
2010	FDC 112	2013	55.3	18.8	7084	29.6	18.9
2011	FDC 112	1453	54.4	17.1	4894	35.1	20.3

Source (Adopted from Institute of Education) Maximum score = 100.

FDC 112—Mathematics (numbers and basic algebra)

DfSHS trainees' average score was far below the pass mark of 50%; however, the average score increased in 2010 and 2011.

From Table 2, the mean score of both groups of trainees in the mathematics content course increased steadily from 2009 to 2011; however, the mean score of the DfSHS trainees was far better than that of their UTDBE counterparts.

The mean scores of the two groups in an Integrated Science content course (FDC 114) are reported in Table 3. Table 3 shows that the DfSHS trainees' mean scores in FDC 114 increased steadily from 2009 ($M = 37.5$, $SD = 12.7$) to 2011 ($M = 42.8$, $SD = 12.2$). The UTDBE trainees' mean score in FDC 114 decreased from 2009 to 2010 and increased again in 2011. The average score of the UTDBE trainees was the lowest in 2010 ($M = 25.4$, $SD = 16.8$). Again, it must be noted that the mean scores for both the groups of trainees were below the pass mark of 50%. This is an indication of poor performance by both groups in Science I (FDC 114), with the UTDBE trainees performing worse than the DfSHS trainees.

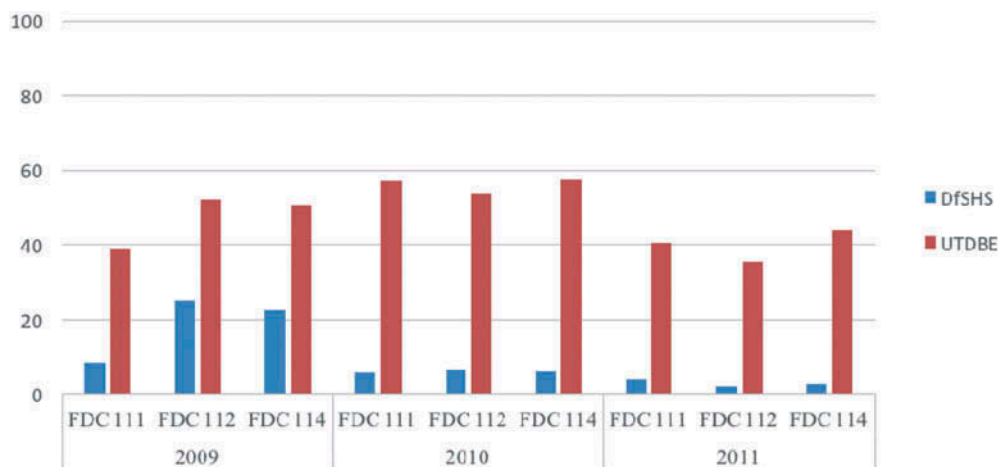
Figure 4 shows the failure percentage in all the three content courses. The failure rate of the UTDBE trainees across all content courses for all the years was over 30% whereas the failure rate

Table 3. Mean scores in science content course (FDC 114) of the two groups of trainees by year

Year	Course	N	DfSHS		N	UTDBE	
			Mean	SD		Mean	SD
2009	FDC 114	3616	37.5	12.7	9475	28.4	15.3
2010	FDC 114	1878	41.4	12.5	7037	25.4	16.8
2011	FDC 114	1498	42.8	12.2	4847	30.2	13.8

Source (Adopted from Institute of Education) Maximum score = 100.

Figure 4. Percentage failures in content course by two groups of trainees by year.



of DfSHS trainees on the same parameter was less than 10%, except in FDC 112 and FDC 114 in 2009. The performance of the UTDBE trainees was the poorest in FDC 114 in 2010, with a failure percentage of 57.3%. In contrast, only 6.1% of DfSHS trainees failed the same course. In other words, less than 50% of the UTDBE trainees passed this course in 2010 compared to over 90% of the DfSHS trainees.

3.3. Teaching practices of newly qualified teachers

The teaching practices of NQTs were compared on the basis of three broad themes: teaching strategies and delivery; assessment practices; and classroom organization and management. The results of the comparison are shown in Table 4–6. From Table 4, both DfSHS and UTDBE teachers reported that they often use structured practices in their lesson. For example, mean scores of DfSHS ($M = 4.6$, $SD = 0.8$) and UTDBE ($M = 4.6$, $SD = 0.9$) for the statement “at the beginning of the lesson I present a short summary of the previous lesson” were the same. The results further show that UTDBE teachers scored higher means on student-oriented practices than their DfSHS counterparts. For example, the mean score of UTDBE teachers ($M = 3.5$, $SD = 1.2$) on the item “Students work in small groups to come up with a joint solution to a problem or task” was higher than that of the DfSHS teachers ($M = 3.3$, $SD = 1.2$). Additionally, UTDBE teachers scored higher ($M = 3.2$, $SD = 1.6$) than DfSHS ($M = 2.5$, $SD = 1.4$) teachers on assigning tasks to students with learning difficulties. Generally, the two groups of NQTs favoured structured practices such as checking students’ exercise books, reviewing with students’ homework they have prepared and asking students to remember every step in a procedure. Both categories of teachers scored more than three, indicating teachers’ reported usage of these activities in their lessons.

Results in Table 5 show how the teachers in the two groups fared on using questions to assess the content grasped by their pupils. Both groups of teachers had high mean scores on the items “I check by asking questions, whether or not the subject matter has been understood” (DfSHS, $M = 4.8$, $SD = 0.6$; UTDBE, $M = 4.6$, $SD = 0.9$) and “I administer a test or quiz to assess students’ learning” (DfSHS, $M = 4.6$, $SD = 0.7$; UTDBE, $M = 4.3$, $SD = 1.1$). This finding underscores the importance of questioning in lesson delivery. Questions are used in lessons to explore students’ responses and elicit students’ reasoning (Muijs & Reynolds, 2010).

However, the type of question asked and the wait-time after a question has been asked are very important aspects of teachers’ lessons. DfSHS teachers scored lower on items 1 and 8 than UTDBE teachers.

Table 4. Mean scores on teaching strategies and delivery for DfSHS and UTDBE in public schools (DfSHS = 84, UTDBE = 56).

	Teaching Practices	DfSHS		UTDBE	
		Mean	SD	Mean	SD
1.	I present new topics to the class (lecture-style presentation)	2.2	1.3	2.5	1.5
2.	I review the homework the students have prepared	3.6	1.3	4.1	1.2
3.	Students work in small groups to come up with a joint solution to a problem or task	3.3	1.2	3.5	1.2
4.	I give different tasks to the students who have difficulties in learning and/or to those who can advance faster	2.5	1.4	3.2	1.6
5.	At the beginning of the lesson, I present a short summary of the previous lesson	4.6	0.8	4.6	0.9
6.	I explicitly state the learning goals at the beginning of each lesson	2.9	1.6	3.6	1.3
7.	I ask my students to remember every step in a procedure	3.5	1.3	4.1	1.2
8.	I ask my students to suggest or to help plan classroom activities or topics	2.1	1.5	2.0	1.4
9.	I check my students' exercise books	4.8	0.5	4.6	1.0
10.	Students work on projects that require at least one week to complete	2.5	1.5	2.8	1.6
11.	I work with individual students	3.4	1.4	4.1	1.3
12.	Students work in groups according to their abilities	2.7	1.5	3.4	1.3

Scores in Table 6 indicate that all the NQTs made efforts to prevent interruptions during their lessons. The low mean scores for items 1 and 2 implies most teachers do not encounter students interrupting instructional hours. Most of the items had high mean scores, suggesting that teachers were focused on organizing and managing the classroom. For example, the items “I establish a learning environment during my lessons,” “I interact with students during my lessons,” and “I facilitate active and responsible cooperation among students in my class” had mean scores above 4.

3.4. Lesson observation

The lesson observation exercise showed 70% of NQTs' introductions lacked linkage to relevant previous knowledge and were not captivating. For instance, an NQT's (UTDBE) introduction to the topic “Story Telling—The Hawk and the Hen” had many flaws. This teacher's vocabulary development efforts, which formed a part of the introduction, were expository in nature. Thus, the duty of the students was only to listen and provide an affirmative response in unison. In terms of lesson presentation, most of the NQTs relied on the “chalk and talk” method of teaching, which precluded any discussion on the application of the concept to real life situations, thereby making the learning of the concept very abstract. Even though DfSHS teachers showed mastery over content knowledge, they did most of the talking to ensure that the pupils follow procedures correctly.

The lesson observation confirmed the structured practices reported by most of the teachers in the survey; however, the practice lacked important elements. UTDBE teachers fared better than their DfSHS counterparts on class control and management. These teachers asked questions to

Table 5. Mean scores on assessment practices for DfSHS and UTDBE in public schools (DfSHS = 84, UTDBE = 56)

	Assessment practices	DfSHS		UTDBE	
		Mean	SD	Mean	SD
1.	I encourage my students to use self-assessment to improve learning and understanding	3.2	1.4	4.1	1.1
2.	Students evaluate and reflect upon their own work	3.2	1.5	3.6	1.4
3.	I check, by asking questions, whether or not the subject matter has been understood	4.8	0.6	4.6	0.9
4.	Students make a product that will be used by someone else	2.1	1.3	2.9	1.5
5.	I administer a test or quiz to assess students' learning	4.6	0.7	4.3	1.1
6.	I ask my students to write an essay in which they are expected to explain their thinking or reasoning at some length	2.9	1.4	2.7	1.5
7.	Students hold a debate and argue for a particular point of view which may not be their own	2.2	1.3	2.5	1.3
8.	Students work individually with the textbook or worksheets to practice newly taught subject matter	3.5	1.5	4.1	1.2

Table 6. Mean scores on classroom organization and management for DfSHS and UTDBE in public schools (DfSHS = 84, UTDBE = 56)

	Teaching Practices	DfSHS		UTDBE	
		Mean	SD	Mean	SD
1.	When the lesson begins, I have to wait for quite a long time for the students to quieten down	2.2	1.3	2.1	1.2
2.	I lose quite a lot of time because of students interrupting the lesson	2.4	1.2	2.7	1.3
3.	I establish a learning environment during my lessons	4.7	0.5	4.3	1.0
4.	I constantly tell students what to do in my class	4.3	0.7	4.2	1.3
5.	I tell my students what to do in my class	4.2	0.8	4.5	0.7
6.	I utilize students' active and responsible behaviors	4.4	0.6	4.1	0.8
7.	I interact with students during my lessons	4.5	1.0	4.7	0.7
8.	I use students' ideas to develop my lessons	4.2	0.9	4.1	1.1
9.	I facilitate active and responsible cooperation in my class	4.5	0.6	4.4	0.7

grab the students' attention. In a mathematics lesson, a UTDBE teacher employed a unique approach to control the class. On some occasions, the teacher was very firm while at other times he was friendlier. Correct answers and class contribution earned applause from learners and a "good" or "excellent" from the teacher. Another UTDBE teacher used the demonstration method for teaching the topic of adjectives. In all the lessons observed, irrespective of the type of teaching method used, teachers asked most of the questions. These questions were sometimes targeted at pupils who could answer them. Further, no group work activities were assigned in many of the lessons observed. Very few pupils asked their teachers questions, and teachers rarely used teaching and learning resources during their lessons.

The lesson observation further revealed some weaknesses in the content knowledge of some UTDBE teachers. This weak content knowledge among the UTDBE graduates could be linked to their weak entry qualifications and achievement during training, as seen in the survey results. An important element of the structured method is summarizing the main points at the end of a lesson. This is to remind students what was done in the lesson and help them organize their learning. Almost all the UTDBE teachers evaluated their lessons well and ended the lessons with a summary of the main points on the board; however, most of the DfSHS teachers performed their evaluation and closure orally, and three of them did not have a closure for their lessons.

4. Discussion

On the basis of the results reported, some implications and conclusions can be drawn about the pre-service teacher training for basic schools in Ghana. The results show that DfSHS trainees entered the initial teacher education program with better grades than their UTDBE counterparts. This is not surprising as more than 80% of the UTDBE trainees had to wait for more than three years to re-take the subjects that they could not pass at the first SHS examination. Another tentative reason for this poor entry grades to teacher training was that the acute teacher shortage especially in underprivileged communities in Ghana, and trained teachers' unwillingness to accept posting to such areas, created the need to "grow" teachers in such communities to improve on the quality of education. Therefore, local education authorities recruited (often without proper screening) secondary school-leavers who could not enroll in post-secondary institutions due to poor grades as teachers to fill teaching vacancies. In the process of recruitment, the untrained teachers' entry qualifications were lowered or ignored (Mulkeen, 2010). The aim was to upgrade them with a standardized curriculum used for the residential teacher training program. The curriculum is the same for all prospective trainees, regardless of their content knowledge level and route to teacher training. As such, all trainees have to read the same content courses during training. It must be noted that the UTDBE students were enrolled on the programme without taking into account their specific academic needs. Despite their weak grades, they have been teaching in classrooms and thus, have garnered a rich repertoire of teaching experiences.

The survey results showed that UTDBE trainees who enrolled in the training program with weak grades showed very weak academic achievement compared to their DfSHS counterparts. This finding corroborates with studies that have indicated that weak entry qualification into teacher training hinders the development of advance content knowledge needed to enhance pedagogical content knowledge (Kruijer, 2010; Mulkeen, 2010). Furthermore, many of the UTDBE teachers showed marked weaknesses in their content knowledge during the lesson observation sessions. This means trainees with weak entry grades ended up with poor content knowledge even after training.

It is pertinent to note that schools in underserved communities, where the UTDBE teachers are teaching are already handicapped due to poor and unattractive facilities, and lack of inadequate teaching and learning resources which culminate into lack of interest in education among community members. As such, if the teachers are under qualified and exit the program with weak academic achievement, it has the potential of reproducing a cycle of students with poor learning outcomes. Given the situation of teacher shortage especially in poor communities, and the

necessity of recruiting untrained teachers to fill the vacancies there, it is important for training institutions to devise mechanisms that will prepare these teachers adequately enough to deliver good quality education. Strong foundation courses, for example, are needed to upgrade the UTDBE teachers' knowledge base prior to the diploma programme. Additionally, it must be noted that although they enter the training program with weak entry qualifications, they also juggle between work and schooling, leaving them with very little time to strengthen their already weak knowledge base, whilst the DBE students who possess better entry grades have much more time in college to concentrate on their studies. Again, Ghana and other similar contexts in SSA where teacher shortage compels policymakers to lower the entry requirements into teacher training should refocus on raising the entry qualifications into teacher training in order to have NQTs with good pedagogical content knowledge which will ultimately have an effect on students' learning (Akyeampong et al., 2013; Ngware et al., 2014).

Overall, the two groups of NQTs favoured structured practices such as checking students' exercise books, reviewing students' homework, and asking students to remember every step in a procedure. These activities enable the teacher to understand the extent to which pupils have grasped the content and whether or not a lesson needs to be re-taught (Schwerdt & Wuppermann, 2011). However, this study found that most NQTs rarely involved their pupils in practical activities such as group work. Extant literature reports that practical activities such as group work are time-consuming; therefore, they are rarely used in many countries (Muijs & Reynolds, 2010). This finding agrees with other studies where student-oriented tasks or practical activities are rarely used by NQTs (Akyeampong et al., 2013) even in some developed countries (OECD, 2010). Further, the inability of the DfSHS teachers to use strategies that promote learners' problem-solving skills, unlike their UTDBE counterparts, casts doubts on whether NQTs actually implement teaching practices that are espoused by the primary school syllabus, which require teachers to use a more participatory teaching and learning process (GES, 2007).

The lesson observation sessions revealed that UTDBE teachers used more practical activities than their counterparts. This finding is not surprising as many of the teachers on the UTDBE program have had over four years of teaching experience and therefore possess some pedagogical skills learnt consciously or unconsciously in the school contexts, compared with their counterparts who entered teacher training directly after SHS. The experience of teaching is consolidated through upgrading. This finding, however, does not support earlier studies conducted in Ghana (Adu-Yeboah, 2013; Akyeampong & Lewin, 2002), which reported that NQTs use fixed procedures and neglect the activity method of teaching. It is worth noting that even though the UTDBE teachers had weak entry grades and weak academic performance during training, they exhibited skills in the use of hands-on activities during the lesson observation. Consequently, they could have been given specialized training in early childhood and early grade teaching so as to reduce the high level of specific subject content.

5. Conclusion

The study suggests that weak subject content knowledge has consequences on the lesson delivery of teachers. As demonstrated earlier, these teachers might have problems in other pedagogical issues such as understanding students' own beliefs on learning (Bofah & Hannula, 2016), building their own teacher identities (Boylan & Woolsey, 2015), making quick practical decisions on classroom practices (Janssen, Westbroek, & Doyle, 2015), or working on cooperation with other teachers (Belfi, Gielen, De Fraine, Verschueren, & Meredith, 2015). Although the Ghanaian basic school syllabus emphasizes teaching practices such as discussions, small workgroups, demonstration, and question and answer, the structured practices observed in the schools lacked some of these important elements. Most of the NQTs used a direct transmissive approach in teaching, which is reported to have less impact on learning. The finding that UTDBE trainees, despite lapses in their content knowledge, saw a marked improvement in their classroom interaction, such as the use of group work, suggests that training of these untrained teachers makes a difference to their pedagogical skills. Our findings imply that upgrading of untrained teachers should be targeted to

those in-service teachers who meet the minimum entry requirements just as their counterparts who enroll on the regular residential program. Furthermore, there should be a paradigm shift of teacher education in Ghana (Brouwer & Korthagen, 2005; Schweisfurth, 2015) to develop trainees' learner-centred pedagogical skills as espoused by the teacher training curriculum.

On the basis of these findings, we recommend the following. The CoEs in collaboration with the Institute of Education, University of Cape Coast, which is the examining body, should properly screen prospective teacher trainees to meet the National Council for Tertiary Education (NCTE) minimum entry requirement to pursue a Diploma in Basic Education. Further, the CoEs should allocate more instructional hours to the teaching of content courses, especially Mathematics, English, and Science. The Ghana Education Service should invest more efforts to organize periodic school-based in-service training for teachers, especially NQTs. However, it should be kept in mind that informal work-place learning that occurs in schools may not always be the only solutions to upgrade NQTS pedagogical skills (Boud & Middleton, 2003). Our study conducted in the Ghanaian context contains important implications for teacher training institutions in other SSA contexts. It is important to examine how teacher trainees are selected as well as determine their background and motivation to be a teacher. As shown in this study, prospective trainees with weak subject content knowledge struggle with academic responsibilities, which affect their teaching after training. This may lead to unfavourable emotional experiences which affect their professional development (Gaines et al., 2019). Hence, exposure to pedagogical content knowledge and subject content knowledge should be balanced in the training of teachers.

6. Limitations

Despite the numerous merits of integrating quantitative and qualitative data by the use of different methods, the two methods (quantitative and qualitative) are based on different assumptions. Some of the survey and the observation findings were sometimes inconsistent. This was to be expected since situations in all the schools may not coincide with generalisations from the survey. Secondly, lesson observation of teachers was done in only primary six Mathematics and English Language lessons. Teaching practices at the lower primary or Junior High School may also have provided much evidence-based information of teaching practices. The current study could have been longitudinal in nature to study the teaching practices of untrained teachers before training and compare with their teaching practices after they are trained. Therefore, further research that include baseline data for the outcomes of interest and then measuring change over time in other similar contexts is needed to add to knowledge in the teacher preparation debate. In spite of these limitations, key issues that emerged from the study will still be relevant for the vast majority of teachers in basic schools and other stakeholders in teacher training in Ghana and other contexts.

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